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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



DECEMBER 2, 1933

**Taking Electricity For a Ride**

See Page 364

A

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XXIV

No. 660

The Weekly  Current  
Summary of Science

Published by

## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian and foreign subscribers please add two dollars (\$2.00) per year to regular subscription rates to cover postage.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 21st and Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Advertising rates furnished on application.

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Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of \$3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienservc, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Offices.

## DO YOU KNOW?

A rose so dark in color that in the sunlight it appears black has been produced in Germany.

Business men desiring comfortable offices are the biggest buyers of air conditioning equipment.

An ordinary potato without butter or cream represents about 100 calories, or about the same amount as a large banana.

Over 3,000 acres of forest have been willed to the University of Virginia and will be used for "practical demonstrations in the art of forestry."

In four months civilian conservation camps have advanced forest and watershed management in California as much as three years' work in average yearly progress.

The physician who accompanies the Byrd Antarctic expedition has a two-ounce bottle of a greenish-yellow substance representing enough Vitamin C for the party for two years.

One school in California's Imperial Valley is heated by water from a hot spring.

The Transparent Man exhibited at the Century of Progress was built almost entirely of plastic materials.

When armor was worn, an esquire would turn somersaults in complete mail except for the helmet, in order to accustom himself to its weight.

The Statue of Liberty in New York's harbor is almost fifty feet higher than the famous Colossus of Rhodes, one of the wonders of the ancient world.

The hay and pasture plant known as lespedeza got its name by mistake, when a French botanist in 1803 named it after the Governor of Florida, whose name was correctly spelled Cespedes.

A scientific test is being made in New Hampshire to see whether a feed ration chosen by a flock of chickens themselves will give better egg laying results than a ration chosen by poultry specialists.

## WITH THE SCIENCES THIS WEEK

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Is a rattlesnake poisonous to itself? p. 361. *Reptiles of the World*—Raymond L. Ditmars—Macmillan, 1923, \$5.

## ELECTROCHEMISTRY

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## PHYSICS

From which direction do most cosmic rays come? p. 356. *Matter and Radiation*—John Buckingham—Oxford, 1930, \$3.

How are the spheres of the Van de Graaff generator charged? p. 364. *Concerning the Nature of Things*—Sir William Bragg—Harper, 1925, \$3.

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## PHYSIOLOGY

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What is "cold sensitivity?" p. 366. *Allergy and Applied Immunology*—Warren T. Vaughan—Moss, 1931, \$4.50.

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To whom should the intellectually trained jobless apply for work? p. 355.

## STATISTICS

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These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.

## SOCIOLOGY

# Intellectually Trained Jobless To Get Immediate Employment

Relief Administration Announces Plan of Adult Education Which Will Absorb Scientific Workers as Teachers

THE INTELLECTUALLY trained but jobless victims of the depression now have a chance to get federal work-relief jobs at once.

As a part of the gigantic drive by the Federal Emergency Relief Administration to transfer those receiving or needing relief to work relief pay rolls, an extensive adult education program is being put rapidly into effect by the Federal Emergency Relief Administration.

Any person now on relief or urgently in need of a job who is a college graduate or has other intellectual ability will be fitted as rapidly as possible into the plan and put on the emergency federal pay roll.

The actual administration and local plans will be in the hands of the states. The local superintendent of schools in each city or town is the person who will have immediate contact with the intellectual jobless.

"We are engaged in a major attempt to conserve our human resources," Dr. Lewis R. Alderman, in charge of the

adult education program for the FERA, explained to Science Service. "It is believed that every person capable of constructive intellectual work should be given an opportunity to aid in the great task of adult education and safeguarding of human abilities that is involved in this work relief program."

The adult education program of the FERA is divided into six parts:

1. Rural schools, which involves the paying of teachers of closed schools which were forced to close before a certain date.

2. Teaching of illiterates, which is construed to mean education of adults up to sixth grade level.

3. Vocational education, a broad program of education in trades and mechanical callings.

4. Vocational rehabilitation, a limited program directed at those physically handicapped.

5. General adult education, a large general program.

6. Nursery schools.

The hiring of the unemployed will be conducted through the states, as a state matter, financed by federal funds. The function of Dr. Alderman's work at the FERA is to approve state plans.

The mechanism of hiring the intellectual unemployed will be operated through the superintendent of schools of the local divisions such as cities and towns, under the general supervision of the state superintendent of schools.

Greatest immediate employment of scientifically trained workers out of jobs will occur under the general adult education project. The procedure will be relatively simple. Teaching certificates or special teaching training will not be required. Where the local organization is slow in taking up the project and working out its own scheme, it will be possible for a competent unemployed intellectual worker with sufficient initiative to work up his own class in an adult education subject, whereupon he will immediately go upon salary.

The rates of payment for this emergency adult education work have been



Bachrach

DR. P. W. BRIDGMAN

*The Comstock prize of the National Academy of Sciences has been awarded Dr. Bridgman, physicist of Harvard University, "for his investigations leading to increased understanding of the electrical constitution of matter." The prize is given every five years in recognition of notable research in electricity, magnetism or radiant energy. Dr. Bridgman is also an authority on the behavior of materials under extremely high pressures.*

liberalized so that the salaries paid will not be limited to \$15 a week, previously announced as the maximum.

Many engineers who have been particularly hard hit by the reduction in building construction and in industrial activity will find that they fit into the vocational education activities of the plan. Under the nursery school project there will be opportunity for the employment of women who have had training in the psychology of young children or experience in teaching kindergartens and lower grades of schools.

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## METEOROLOGY

## Winter as Well as Summer May Bring Dust Storms

DUST STORMS like those that swept over the Midwest a short time ago and to some extent marred the closing of Chicago's Century of Progress are generated by the same air mechanics that build the beautiful fleecy cumulus clouds of the middle strata of the atmosphere. When the sun has been shining strongly on the earth for some time a consider-

## JOBS FOR BRAINS OUT OF WORK

DO YOU KNOW anyone, with a college education, who is out of a job? Intellectually trained persons now in need of employment, who are capable of aiding in the extensive adult education plans of Federal Emergency Relief Administration will be considered for jobs almost immediately under the new work relief plans of the Federal Emergency Relief Administration, to be operated through the state and local school systems. Those who are now on relief rolls or in need of relief who think that they are qualified should apply to local Superintendents of Schools.



able mass of air is warmed, and since warm air is less dense than cold, it begins to rise, sometimes nearly vertically. If there is plenty of moisture in the soil and vegetation, these rising air currents carry up water vapor; which on cooling in the upper levels condenses into clouds.

If, however, there has been a drought of several weeks' duration, as frequently happens in the West in late autumn and early spring, the vertical air currents carry up quantities of fine soil particles, and these, swept along by the northwesterly storm winds, later descend on areas farther to the east as blinding clouds of dust.

Dust storms are possible even in the depth of winter, if there are areas left free of snow for any length of time. Such dust storms frequently become mingled with snow to form the blizzards that have well earned the soubriquet, "the gray tiger of the North," for such blizzards have so much dust in them that the air appears not white but gray.

The dust storms that seem so distressing to us nowadays are mere zephyrs by comparison with those that swept the mid-latitude of the earth at the close of the last great Ice Age. These, raging for probably scores of thousands of winters, piled up thick deposits of that peculiarly fine-grained soil known as "loess."

*Science News Letter, December 2, 1933*

#### MEDICINE

### Smallpox Virus From Eggs "Takes" in Vaccination

**S**mallpox virus grown on fertile hen eggs has been used successfully to vaccinate eleven persons in Nashville, Tenn., Prof. E. W. Goodpasture and G. J. Buddingh of Vanderbilt University Medical School report in *Science*.

The vaccinations "took" as well as those performed on a group of controls vaccinated with the usual virus from calf lymph. Further studies are in progress to test the durability of the protection this method gives.

The method was developed by Prof. Goodpasture and his associate, A. M. Woodruff. German and British investigators have recently repeated the experiments successfully. Some advantages of the method are the ease with which the vaccine may be produced at any time fertile hen-eggs are available and the absence of bacteria or other contaminating agents.

*Science News Letter, December 2, 1933*

#### PHYSICS

## 10,000 Observations Yield New Cosmic Ray Theories

### Conclusions That Rays Are Positive and More Abundant Conflict With Lemaître and Millikan Hypotheses

**C**OSMIC rays are probably the hearts of atoms of ordinary matter, positively charged by the action of starlight on interstellar gas, and accelerated in some cosmic or possibly terrestrial electrical field.

Ten thousand observations of cosmic ray intensities just completed in Panama and Peru and earlier studies in this country and Mexico have led Dr. Thomas H. Johnson of the Franklin Institute's Bartol Research Foundation in Swarthmore, Pa., to this conclusion, which is contrary to other theories of cosmic ray formation.

Using a sort of cosmic ray "telescope" that "sees" on a motion picture film only the cosmic rays that pass through three-in-line Geiger-Mueller counting devices and set off in them simultaneous electrical pulses, Dr. Johnson has now definitely established that the western sky is "brighter" with cosmic rays than the eastern sky. If our eyes could see the cosmic ray corpuscles as they do the waves of ordinary visible light, they would see more cosmic ray light in the west. This difference in cosmic ray brightness between the east and west is also greater at higher elevations and nearer the magnetic equator.

#### Less Near Magnetic Equator

Dr. A. H. Compton, University of Chicago Nobelist in physics, and Dr. J. Clay, a Dutch physicist, have shown by their researches that the local intensity of the cosmic radiation decreases towards the magnetic equator. The lower equatorial intensities were readily explained by the supposition that part of the primary radiation consisted of electrified particles but these studies could not determine whether the electrical charges were positive or negative. By the same physical laws that make it possible to determine which way the electric current is flowing in the wires of a motor from the direction in which its armature rotates it is also possible to determine whether the charges of the cosmic rays are positive or negative

from the way their paths are bent by the magnetic field of the earth. The fact that they are bent towards the east and therefore enter from the west means that the rays are mostly positively charged as any high school physics student can verify. This fact was first indicated a year ago as a result of Dr. Johnson's studies on Mt. Washington.

#### No Negative Rays

His most recent work on the equator in Peru now gives him data which allow him to conclude that all of the cosmic ray corpuscles in the energy range which is affected by the earth's magnetic field in equatorial latitudes are positive and there are no negative rays. The fraction of the total radiation which now can be directly attributed to the electrified radiation is also much higher than had been supposed previously. In fact, these measurements show that at least forty per cent. of the total radiation is of this nature.

Most of the rays which are actually observed are known to be of secondary origin, produced in the atmosphere by the bombardment of the primary radiation. These secondary rays are positively and negatively charged corpuscles in about equal numbers, as Dr. Carl D. Anderson of California Institute of Technology has shown, but since their directions of motion are the same as those of the primary rays it is possible to use their directions as an indication of the directions of the primary rays before they enter the atmosphere.

His results lead Dr. Johnson to challenge several proposed theories of cosmic ray origin and propose a theory himself.

#### Favored Theory

One of the most favored theories was advanced by Abbé Georges Lemaître, the Belgian priest-cosmologist now lecturing at the Catholic University of America. The Lemaître theory supposes that cosmic rays were produced during the earliest stages of the evolution of the universe by the disintegration of huge

super-radioactive atoms. Under this theory cosmic rays would contain both negative and positive rays just as the radiation from radium does, and the absence of negative rays, Dr. Johnson points out, would be a denial of theory.

"The existence of but one sign of charge in this radiation," Dr. Johnson says, "is just what would be expected if the cosmic rays were produced by an electric field surrounding the earth. The direction of this field would have to be such that the positive ions, which are produced in interstellar space by the action of starlight on the small residue of gas, would accelerate towards the earth. It is extremely difficult to see how such a field could be maintained against the discharging action of the cosmic rays and of the negative rays which would be swept away from the earth by it. There is, however, some independent evidence from atmospheric electric measurements that such a field may exist."

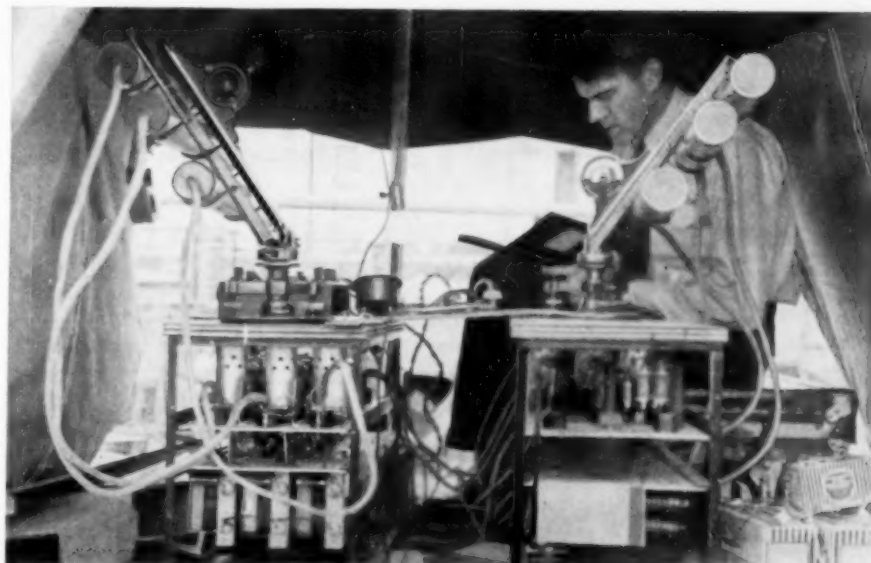
Dr. R. A. Millikan, California Institute of Technology physicist and Nobelist, recently concluded, on the basis of his theories, that a considerable portion of the total energy of the universe consists of cosmic radiation, but upon Dr. Johnson's theory the cosmic radiation would not be uniformly distributed throughout space and therefore the estimates of the total energy contained in cosmic radiation would need revision.

### Counted 1,000,000 Rays

During his recent trip to Panama and Peru, Dr. Johnson with his automatic photographic instruments counted over a million cosmic rays. In Peru observations were taken upon mountains at elevations of 14,000 feet and 11,000 feet as well as sea level. Upon a previous trip this summer to Mexico, he made observations at 10,000 feet and 7,500 feet and sea level, while his colleague, Dr. E. C. Stevenson, made similar cosmic ray counts in Colorado at 9,500 feet elevation and at Swarthmore.

Clockwork and other automatic devices fitted to the cosmic ray counting device, given its try-out on Mt. Washington about a year ago, have allowed Dr. Johnson to gather large amounts of data and reduce markedly the probable error of his experiments which in many cases is now only about five per cent. Funds from the Carnegie Institution of Washington and the Carnegie Corporation of New York helped make possible the work and a preliminary report is published in *Physical Review*.

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### COUNTING COSMIC RAYS

*Dr. Thomas H. Johnson, Franklin Institute physicist, is shown with apparatus in his tent on a roof-top in Mexico during a recent expedition to measure cosmic rays.*

### ANTHROPOLOGY

## Language Record Made Before "Last of Mohicans" Passed

THE LAST aged Indian who could speak the Mahican language died recently, in Milwaukee. So passed a man who might be called "the last of the Mohicans."

The novelist Cooper was a little premature in coining that phrase, the last of the Mohicans, for his Indian hero Mohicans, or Mahicans as scientists spell the name, have added many years to their history since Cooper wrote.

But William Dick, who could speak the old tongue, did represent the end of a phase in that history. The Mahican greetings that Cooper's Indian heroes would have exchanged so lustily will never again be spoken by an Indian. William Dick was the last person who knew them.

There is some comfort for science in the fact that several years ago, Dr. Truman Michelson of the Smithsonian Institution visited Mr. Dick and recorded carefully many words and sentences of his mother tongue. These records are now among the valued possessions of the Smithsonian. By the study of the Indian languages, it is possible to prove and check many events in America's Indian history; hence the importance of gathering data on these fast vanishing forms of speech.

Dr. Michelson, who reminisces about his work with Mr. Dick, admits one diplomatic error in dealing with the aged Mahican. He might have gathered more Mahican words and sentences, but for that unlucky tactical mistake.

The last of the Mahicans to speak the old language was no hard-fighting, sharp-shooting, befeathered redskin, but a dignified Presbyterian elder. The Mahican side of Mr. Dick clung to the memory of his native speech, but the Presbyterian side of him held grave fears that the old language was a relic of paganism, with which he should not be too much concerned—even for the worthy cause of science.

However, Dr. Michelson was persuasive and friendly, and the old Mahican gave his time to recalling the old speech. And then, one day, Dr. Michelson suggested that Mr. Dick excuse himself from teaching his Sunday School class to devote a Sunday to the language rescue work. And that upset the scientific apple cart. The Indian's worst suspicions were confirmed and he would work no longer.

Even William Dick does not represent the final passing of the Mahican tribe.

*Science News Letter, December 2, 1933*

## PUBLIC HEALTH

# Bill Would Prevent Sale Of Poisons in Disguise

**Proposed Pure Food Act Contains Teeth Where Present Law Is Helpless, and Regulates Sales of More Articles**

EDITOR'S NOTE: *This is the first of two articles discussing the New Deal's proposed Pure Food and Drug Law. They are written by Dr. Frank Thone, Science Service staff writer.*

ONE OF the outstanding items of "New Deal" legislation which will come before Congress when it convenes in January is the new Pure Food and Drug Bill, which will be introduced into the Senate by Sen. Royal S. Copeland of New York. Committee hearings are scheduled to begin on Dec. 7, and already the forces pro and con are being mustered, and preliminary skirmishes of words between advocates and opponents have taken place.

Since it is an open secret that Mrs. Roosevelt is actively crusading for the measure, which was written at President Roosevelt's direction in the office of Dr. Rexford Tutwell, Assistant Secretary of Agriculture, support both formidable and colorful can be expected, against the strong opposition which has already shown itself in some quarters.

The bill goes far beyond the pioneer law obtained at the hands of Congress in 1906 by the veteran crusader, the late Dr. Harvey B. Wiley. Among other things, it provides for the establishment of standards for all food products, it directly forbids the offering of medicines as "cures" for certain diseases, it penalizes false or misleading advertising as the present law penalizes false or misleading labels.

## Cosmetics Included

But perhaps the most marked innovation in the Copeland bill is the inclusion of cosmetics along with food and drugs. These were omitted from consideration in the 1906 act, as of insufficient importance to merit legislators' attention. Yet it is worthy of note that in spite of the chances for humorous treatment of this section of the bill very few jokes have yet been offered. The cosmetic trade has got into the billion-dollar class since the simple, unrouged days of 1906, and important money like that isn't a joking matter now.

Besides, as defined in the bill, cosmetics include a great many things besides powder, lipstick, eyebrow pencil and suchlike aids to feminine charm. The term includes "all substances and preparations intended for cleansing or altering the appearance of, or promoting the attractiveness of, the person." That is, for the purpose of the new bill, soap and toothpaste and shaving cream and face lotion and a lot of other things used by the masculine half of the household are cosmetics. It is to protect the interests of the public along this very extensive front, as well as to safeguard the legitimate manufacturers of toilet articles against "chisellers" who invade their industry, that the cosmetics section has been added, to make the legislation a Pure Food, Drug and Cosmetics Bill.

## Poisons on Dressing Table

Depilatories that make you bald, eyelash dyes that make you blind, hair restorers that make you lingeringly sick with lead poisoning. These are some of the perilous stuffs that you can have on your dressing table now, but which you will be protected against, if the new bill is enacted into law.

Such deadly drugs are not at all universal among cosmetics. The older, more reliable cosmetic manufacturers realize that it is not good business to have their customers poisoned or disfigured, and strongly reprobate the "chiseler" concerns that enter the market with poisonous beautifiers, sell a lot of them by means of a powerful campaign of advertising, and then fold up and vanish with their swag, leaving the more decent firms to bear the burden of public disapproval and suspicion for acts of which they were never guilty.

Some of the poisons used in illegitimate cosmetics are little known and seldom used; others are as old as the Borgias and return to the market again and again under different aliases.

Among the less known of these harmful substances is thallium acetate. It was used not long ago in a depilatory

cream, which is no longer manufactured or advertised, although stocks of it still exist on drugstore shelves and jars still stand on dressing tables. It was a most effective depilatory; it not only removed superfluous hair, but it got into the blood stream and attacked hair wherever it found it. Many of the unhappy users of this preparation lost every hair they possessed. Before a flood of damage suits, the manufacturers of this disfiguring stuff hastily quit business, leaving no assets against which judgment could be levied.

## Dangerous Compounds

Another poison, even worse in its effects, is a certain aniline dye, still used in one type of eyelash stain. If it accidentally gets into the eye, it may peel off the first coat of the eyeball, and perhaps also the second, even causing total blindness. It may also cause horrible disfigurement of the skin around the eyes.

More familiar and more commonly used poisons are lead compounds, used in hair restorers, and mercury salts, used in skin bleaches. These may work their way through the skin and enter the blood stream, which carries them to the internal organs. Lead and mercury both cause extremely stubborn and highly distressful poisoning, which may result fatally in aggravated cases.

Chemists at the Food and Drug Administration of the Department of Agriculture smile a bit grimly over the irony of warning motorists against letting even a small quantity of lead-containing gasoline get on their skins, only to have them go home and put a lead-containing hair remedy on their heads.

When the Copeland bill comes up for hearings before the Senate committee and for debate on the floor, the hottest

## THE LIVING CELL

an address by

**Dr. Robert Chambers**

Professor of Biology, New York University

Wednesday, December 6, at 4:35 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.





bombardment will come from certain sectors of the proprietary medicine trade. They have already trained their guns on Assistant Secretary Tugwell, taking full advantage of the opportunity for sarcasm offered by the fact that he is a professor.

The crux of the fight will turn largely on the "misrepresentation" question. At present, misrepresentations are forbidden on the actual labels of the products, but makers can make any claims they wish over the radio, on billboards, in direct-by-mail or printed advertising. The new bill would forbid all that, with stiff penalties for violations.

### Inadequate Legal Means

The proprietary-remedy opponents of the new bill claim that such additional precautions are unnecessary, that there are legal means at present adequate to punish makers of false claims. There are legal means, but they are hardly adequate, for the courts have ruled that to prove fraud in a claim for curative powers in a preparation offered as a remedy, it must be proved not only that the stuff is not a remedy, but that the maker knows that it is not, and that he has made his claims with the deliberate intention to deceive and defraud. In practice, it has often taken years of watchful waiting and tedious litigation to make a case against the baldest kind of fake "cures" for tuberculosis, cancer, diabetes and other incurable diseases. The record hardly bears out the claims of the bill's opponents as to the adequacy of present legal redress.

There are many teeth both sharp and long a-bristle on the jaws of the bill, to snap up predatory medicine-men who fatten on the pathetic faith of sick folk, but perhaps the neatest row is one clause that simply classifies as automatically false "any advertisement of a drug representing it directly or by ambiguity or inference to have any effect in the treatment" of a long list of diseases, including such favorites of drug-vending quacks as: blood poison, cancer, diabetes, dropsy, paralysis, "sex weakness," tuberculosis and tumors. If the supporters of the bill can get that section through the gauntlet it will undoubtedly have to run, a lot of fake medicine men will find their occupation gone!

The bill also provides that if a preparation is merely a palliative for a disease, it must be so mentioned, plainly, in the advertising. Furthermore, if a preparation contains any habit-forming drug, a warning to that effect must appear on the label. Finally, names of in-

gredients used in all preparations must be given, and they must be given in plain English. The great American privilege of self-medication will be preserved, but you are going to get a chance to know what you are swallowing.

*Science News Letter, December 2, 1933*

### AERONAUTICS

## Stratosphere Flight Successful for Science

THE STRATOSPHERE flight of Lieutenant-Commander T. G. W. Settle and Major Chester L. Fordney was a complete success from the scientific standpoint, a preliminary examination of the data indicates. In a statement to Science Service, Prof. Arthur H. Compton of the University of Chicago, gives high credit to their efforts and skill, and also to the painstaking preparation of the cosmic ray apparatus by Dr. R. J. Stephenson. Definite results are not yet ready for announcement, Prof. Compton said. Considerable time will have to be devoted to the study and analysis of the data before their full significance can be put into form for publication.

The altitude reached on the Settle-Fordney flight is about 8,000 feet more than that of the August, 1932, Piccard ascension and about 1,000 feet less than that reported recently from Russia. (SNL, Oct 14, '33, p. 245). The latter figure, however, has not been approved under international requirements, while the other two have been approved.

*Science News Letter, December 2, 1933*

### SEISMOLOGY

## Earth Shakes Severely In Region Usually Quiet

THE EARTHQUAKE that kept seismographs throughout the country trembling Monday evening, Nov. 20, was centered under water in Baffin Bay between Baffin Island and Greenland, an unusual location for so severe a shock which would have been very destructive had it occurred on populated land. History does not record previous severe quakes in that area.

Location was determined by the U. S. Coast and Geodetic Survey, using reports wired Science Service from seismological observatories in this country, Canada, England and India. The epi-



*Acme*

### GOING UP AT AKRON

The Century of Progress stratosphere balloon is shown taking off from the Akron airport Monday morning, Nov. 20, on its successful flight. The first flight, attempted Aug. 5 in Chicago, resulted in an unexpected landing a few minutes after the take-off when a valve failed to work. After leaving Akron, the balloon reached an official height of 61,327 feet and returned to earth near Bridgeton, N. J., in the late afternoon on the same day of the take-off.

center was at about 73 degrees north latitude and 69 degrees west longitude and the time of origin was 6 hours 21.5 minutes p. m., Eastern Standard Time.

The shock was so severe that it was recorded on sensitive magnetic instruments at the U. S. Coast and Geodetic Survey Observatory, Cheltenham, Md., even though these instruments are not designed for recording earthquakes.

Earthquake experts at Kew Observatory, London, suggest that there must have been an immense slippage of submarine rock to cause the disturbance.

*Science News Letter, December 2, 1933*

## OBSTETRICS

**Most of Maternal Deaths Found to be Preventable**

**N**EARLY two-thirds of the mothers dying in childbirth could have been saved if they had had proper care, a committee of the New York Academy of Medicine has found after a three-year survey. Physicians were held responsible for three-fifths of the preventable deaths. The patients themselves were responsible for more than a third of these deaths and midwives for about two in every hundred. Lack of judgment, lack of skill or careless inattention to the demands of the case were faults of the physicians. The patients' fault was failure to take advantage of facilities at hand for safeguarding them.

The committee believes that the number of deaths can be reduced by reducing the amount of surgical interference during birth. Surgical procedures are resorted to four or five times oftener than actually necessary. The death rate in these cases is five times as high as in spontaneous births.

Comparing the number of deaths of hospital births with home births, the committee found that the increase in hospitalization failed to reduce sickness and deaths as much as had been hoped for. However, it was observed that generally only normal, uncomplicated births take place in the home.

*Science News Letter, December 2, 1933*

## ASTROPHYSICS

**Most of Atmosphere Lost When Earth Was Young**

**C**OMPARED with the totally airless, arid moon, the earth is richly endowed with atmosphere; nevertheless the air and clouds it has are a mere remnant of its original birthright. So declared Prof. Henry Norris Russell, Princeton astronomer, who reported before the National Academy of Sciences on researches he conducted jointly with Dr. Donald H. Menzel of Harvard College Observatory.

"There is a fairly general agreement of cosmic and terrestrial abundances of metallic elements, but a large discrepancy in the abundances of the permanent gases, in particular hydrogen, helium, nitrogen and neon," Prof. Russell told the Academicians. "The obvious inference is that the earth has lost most of these gases initially present, as the moon has lost its atmosphere.

"An examination of the conditions of escape shows that this could have occurred only if the original temperature of the earth were very high, 5000 degrees Centigrade or greater. The cooling would have been very rapid and the conclusion seems unavoidable that most of the loss occurred during the first few years if not the first few days of the planet's independent existence, with the loss of hydrogen practically immediate. For substances such as water and carbon dioxide, which may enter into the composition of molten magma, no difficulty arises."

With the earth as cool as it is now, no atom can escape for temperature reasons alone, Prof. Russell continued. But electrically excited oxygen atoms colliding with hydrogen and helium atoms could impart to the latter velocities to enable them to escape from the earth's grip. That such excited atoms exist is shown by certain lines in the spectrum of the aurora; so it is possible that the earth may still be losing a little of its atmosphere.

*Science News Letter, December 2, 1933*

## PSYCHOLOGY

**Brain Behind Temples Directs Many Activities**

**W**HEN Paderewski ripples his fingers over the keys, when the massed thousands in the stands sway their bodies in unison with the gyrations of the cheer leaders, when you yourself perspire or blush, it is one definite area on the surface of the fore-brain that is responsible for all these varied activities. Skill with the fingers, major postural adjustments of the body, and the regulation of such involuntary actions as sweating and blood-vessel adjustment, have been traced to that part of the brain just behind the temples, by Prof. J. F. Fulton of Yale University, who reported his studies before the National Academy of Sciences.

Prof. Fulton conducted experiments on monkeys and chimpanzees, partly by directly stimulating the brain part concerned, known as the "pre-motor area," and partly by studying the defects in the activities of animals in which this area had been damaged. Since the brains of monkeys and apes are similar to those of human beings in a general sort of way, it is legitimate to infer that this little patch of the brain has the same functions in ourselves as it proved to have in Prof. Fulton's animals.

*Science News Letter, December 2, 1933*

**IN SCIENCE**

## PHYSIOLOGY

**Same Chemical Structure Affects Body Differently**

**W**IDELY different effects may be brought about in the body by substances having the same chemical structure, is the suggestion found in research just reported by Drs. J. W. Cook and C. L. Hewett, of the Cancer Hospital Research Institute, and Prof. E. C. Dodds and W. Lawson, of the Courtauld Institute of Biochemistry, to the Royal Society of London.

An effect similar to that caused by a female sex hormone may be produced in animals by substances known to chemists as condensed carbon ring compounds. Some of these are structurally similar to and others differ considerably from the oestrus-producing hormone itself. Two of the compounds, in addition to their ability to awaken sexual desire in animals, are potent cancer-producing substances, and one of them is calciferol, crystalline form of rickets-preventing vitamin D.

These synthetic compounds with the widely different effects on the body changed the male plumage of capons to female plumage when injected into the bird's body, Drs. Cook, Dodds and A. Greenwood reported.

*Science News Letter, December 2, 1933*

## ANATOMY

**Eyeball Does Not Pivot Exactly on Its Center**

**T**HE HUMAN eyeball does not pivot itself exactly on its center as has always been supposed, Prof. Walter R. Miles, of Yale, has discovered and reported to the National Academy of Sciences.

He found that both when the eyeball rolls upward and when it swings from side to side, as in reading, it rotates on a shifting pivot. This may be only a small fraction of an inch off its exact center, but it is of considerable importance both as a point in "pure anatomy" and as a matter of practical optical mechanics for eye specialists.

*Science News Letter, December 2, 1933*



# IN FIELDS

## STATISTICS

### Most Pedestrians Killed Walking Along Roads

USE EXTREME caution on the country highway, and when crossing city streets cross at the intersection with the signal! These warnings for pedestrians may be gathered from a study of fatal accident statistics just completed by the Travelers Insurance Company.

About 13,500 persons were killed last year in collisions between automobiles and pedestrians. The rate of death from these accidents was highest for those walking on country roads and much worse during dusk and darkness than in daylight hours. Crossing an intersection against a signal is nearly half again as hazardous as crossing with a signal. Crossing at the middle of the block is still more dangerous.

*Science News Letter, December 2, 1933*

## BIOLOGY

### Protozoan's Severed Trunk Keeps on Gathering Food

WHAT WOULD you do if you saw an elephant's trunk with no elephant attached, going about picking up peanuts and hay, and trying to put them into a mouth that wasn't there?

This was, in miniature, what Jerome Metzner of Columbia University saw through his microscope, when he amputated the proboscis from a one-celled animal known as *Dileptus*, and turned it loose where food was to be had. Mr. Metzner reports his observations on a number of such operations in *Science*.

*Dileptus* has a long proboscis, almost as long as its minute body, which it uses in capturing smaller organisms which serve it as food and conveying them to its mouth-opening. When Mr. Metzner cut off several of these proboscides and put them where food was available, they continued to attack the food-organisms and pass them on to the back ends of the amputated organs, where the mouth used to be situated. Then they lost interest in them, and

went on to attack and pass back more victims.

Mr. Metzner also amputated some of the proboscides along a line a little farther aft on the owners' bodies, leaving the mouth-opening attached. In these cases the wandering "trunks" captured food-organisms and passed them back and into the mouths, just as though the whole original animal were still there to be fed. Not only that, but the food particles were held in cavities formed in the protoplasm in the body-fragment back of the mouth. The whole thing, Mr. Metzner remarks in conclusion, shows that a small specialized portion of the organism is capable of the same complicated response characteristic of the total organism.

*Science News Letter, December 2, 1933*

## PHYSIOLOGY

### Normal Tissue Extract Checks Growth of Tumors

CERTAIN types of cancerous tumors have their growth checked by the injection of an extract made from normal growing animal tissues. At the meeting of the National Academy of Sciences in Cambridge, Mass., Dr. James B. Murphy of the Rockefeller Institute for Medical Research, New York City, told of the latest work on this substance, whose effects are partially known but whose chemical composition is still wholly in the dark. Dr. Murphy has worked with tumors in mice and his research is not yet ready for application to human cases.

The tumor-inhibiting substance has been found in tumors themselves, and an inhibitor, which may be the same or may be a different substance producing similar results, has also been found in placental tissues and embryo skin. When these normal tissue fractions were used on natural or spontaneous cancer of mice, "their inhibiting action is evident not only on local post-operative recurrences of the disease and on the growth of autografts where there is direct contact between the extract and the cancer cells, but is definitely observable when the test fluids are injected at a distance from established tumors," said Dr. Murphy. "While the results seem to substantiate the suggestion that the inhibitor from tumors is similar to the balancing factor of normal tissues, and would give a possible insight into the mechanism involved in malignancy, the materials involved are too complex to justify a conclusion at this time."

*Science News Letter, December 2, 1933*

## ELECTROCHEMISTRY

### Freshness of Fish Measured Electrically

DETERMINING the freshness of fish by electricity is the latest achievement of the U. S. Bureau of Fisheries. Maurice E. Stansby and James M. Lemon, at the Bureau's Gloucester laboratories, needed a quick, accurate method for telling just how long a fish had been out of water.

They found that the fish, soon after being caught, became stiff, then as time went on, relaxed and became more and more limp till finally it began to decay. They knew that the stiffness was caused by the production of lactic acid, the "sour" of sour milk, which caused the muscles to become rigid. Then, as this disappeared and the muscles were attacked by their own juices, they became limp.

How to follow this process more exactly than was possible by simply seeing how limp a fish became was the problem. Stansby and Lemon solved it when they found, as was predicted by theoretical chemistry, that they could pass more electricity through a fresh fish than through one that had been caught some time.

The apparatus they use is one that is familiar to radio men and telegraph engineers. It is called a Wheatstone bridge, and is an instrument that measures just how much resistance is offered to the electric current by the material being tested; in this case, some of the fishes' muscles ground up with water.

*Science News Letter, December 2, 1933*

## BIOLOGY

### Baby Rattler Dies From Self-Inflicted Bite

SNAKES are not immune to venom of their own or of other species of snakes, it appears. A baby rattlesnake in the zoological laboratory of the Fort Hays Kansas State College bit itself accidentally during a fracas in the cage where it lived with its mother and brothers and sisters. Before it could release its fangs from its own body, it had apparently injected enough of its own venom to cause its death a few hours later. Reporting the incident to *Science*, Prof. L. D. Wooster recalls that another investigator reported the death of a rattlesnake from water moccasin venom.

*Science News Letter, December 2, 1933*

## ASTRONOMY

# Orion Comes Into View

## Glorious Constellation Aids Location of Many Brilliant Heavenly Bodies That Decorate December Evening Skies

By JAMES STOKLEY

**M**ARKING the last month of the year, the glorious constellation of Orion, perhaps the finest in the heavens, comes into view in the southeastern evening sky. Even persons who are not students of the constellations will probably recognize the familiar row of three stars that form the heavenly warrior's belt. To the ancients, Orion was a mighty hunter, who, with upraised club and lion skin thrown over one arm, was about to smite the bull, Taurus, represented in a neighboring constellation.

This evening in the southeast, if it is clear, you can see these stars, the belt almost upright and the warrior in the somewhat undignified position of lying on his back. To the north of the belt is the brilliant star Betelgeuse, to the south, Rigel, and above, Bellatrix.

The stars of the belt also have names. The lowest is called Alnitak, the middle Anilam and the top Mintaka. Like Bellatrix, these stars are of the second magnitude, Betelgeuse and Rigel being of the first.

### Beautiful Object

Extending southward from Alnitak is a curved row of fainter stars that forms the warrior's sword. In this sword is one of the most beautiful objects revealed by the telescope, the great nebula of Orion. A vast cloud of glowing gas so huge that a beam of light requires 600 years to cross it, this nebula is estimated to contain ten thousand times the sun's mass. Even a small telescope will show it as a hazy patch around theta Orionis, one of the stars in the sword.

Above Orion is the bull, Taurus, which the warrior is about to strike. Follow a line upward through the belt and Bellatrix, and you come to a bright reddish star. This is Aldebaran, the eye of the bull.

Taurus is one of the constellations marking the ecliptic, the path of the planets, the sun and the moon. Four thousand years ago, Taurus was at the vernal equinox, the position of the sun

on the first day of spring. But by means of the phenomenon called precession (often misprinted "procession") the entire celestial sphere, with all the constellations, slips around the ecliptic once in about 26,000 years. Two thousand years ago, the vernal equinox had moved into the next constellation of Aries, and today it is in the next one, Pisces.

### Astrologers Neglect Precession

Astrologers, who think they can tell fortunes by studying the stars, pay no attention to that fact. They still talk about the position of the planets in the various signs, and the signs are not in accord with the way the constellations are today, but the way they were two thousand years ago.

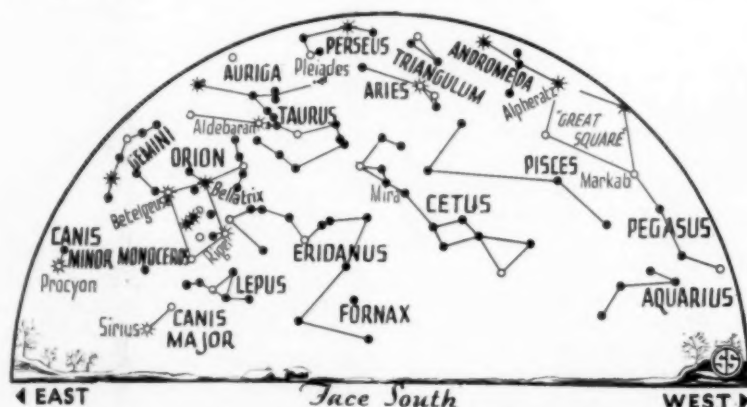
Aldebaran belongs to a loose V-shaped cluster of stars called the Hyades. In the same constellation, Taurus, there is an even more famous loose cluster, which can be seen above the Hyades, nearly directly overhead. This is the Pleiades. Six stars can be seen with the naked eye, but even a pair of opera glasses increases the number, and, with a small telescope, as many as a hundred become visible. Photographs with great telescopes show thousands, and also reveal that the group is enveloped in a nebulous cloud which seems to shine by reflected starlight. The distance of the cluster is supposed to be about 350 light years, and it is about 35 light years in diameter.

Now look below Orion, and you will see the most brilliant star in the sky, Sirius, the dog star, marking Canis Major, one of the two dogs accompanying the hunter. The other, Canis Minor, is farther north, and is marked by the bright star Procyon. Sirius is of magnitude minus 1.58, so that it is about 325 times as brilliant as a sixth magnitude star, the faintest that we can see with the unaided eye. Though it is about 27 times as brilliant as our sun, which is also a star, it is not really of exceptional brilliance, for many other stars have far greater candlepower. Rigel, for example, is of about 14,000 times the sun's intrinsic brilliance though it looks considerably fainter than Sirius.

But Rigel is so distant that its light takes 460 years to reach us, travelling all the time at a speed sufficient to take it across the United States in a sixtieth of a second. Sirius is a close neighbor, however, only 8.7 light years distant. Expressed in miles, which are really rather meaningless when applied to such vast distances, this is about 52 trillion. No other naked-eye star that we can see from the latitude of most of the United States is so near.

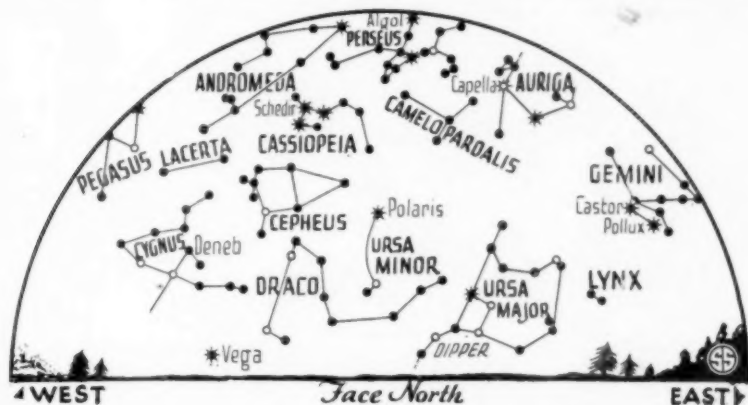
### "By Jiminy"

Procyon, in Canis Minor, is low in the east, and above it is the constellation of Gemini, the twins. Castor and Pollux are the names of the youngsters. Pollux, the brighter of the two, is nearer the horizon. Gemini is another of the constellations marking the ecliptic, and like Taurus it dates back to very early times. Castor and Pollux were favorite Roman deities; among the best known of Roman ruins are their tem-



Sirius, low in the southeast, is the most brilliant star in the sky.

• • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



The star Capella in the constellation Auriga is the most northerly of first magnitude stars this month. Though its two bodies cannot be distinguished through even the largest telescope, astronomers have found that this is a double star.

ples at Rome and Girgenti. Ancient mariners used to swear by them, and a corruption of this ancient oath survives in our modern "by jiminy."

Above the twins is the charioteer, Auriga, in which we find the brilliant Capella, most northerly of the first magnitude stars, and visible from these latitudes at some time every night. It is 150 times as bright as the sun, and 47 light years distant. Capella is the best known of a large class of stars called spectroscopic binaries. Something like six per cent. of the stars in the sky are shown by existing telescopes to be double, that is, to consist of two separate bodies which revolve around their common center. Besides, there are many other doubles so close to each other that no existing telescope is able to reveal directly the two bodies of the system. Only by analyzing their light through the prisms of the spectroscope is their true nature revealed.

Everyone knows how, when a fire engine races down the street, its bell or siren sounds of a higher pitch when approaching than when receding. The same thing can be noticed with the bell or whistle of a locomotive. The pitch of a bell depends on the distance between the sound waves entering our ears. When they are close together, the sound is high-pitched, or shrill, and when the waves are farther apart, it is deep, or low-pitched. But if the source of the sound, the fire engine siren, for instance, is rapidly approaching us, one wave leaves the siren, and then, before the next one has left, even though it is only a fraction of a second later, the engine has moved a little closer, and consequently the next wave

reaches us a little sooner than it would have otherwise. Thus, the distance between the waves of an approaching source of sound is shortened, while if it is receding, the waves are spaced farther apart.

Exactly the same thing happens with light, and for the same reason. Only instead of changing the pitch, there is a shift in the dark lines crossing its spectrum that can be photographed with the spectroscope. This fact is used for measuring the speed of approach or recession of the stars. If the star is approaching, these lines are moved to the blue end of the spectrum, while if it is receding, they are shifted towards the red end. The greater the shift, the faster the motion of the star.

#### Hidden Doubleness

The spectrum of Capella changes in a singular way. Its lines are sometimes single, and sometimes double. Astronomers interpret this as meaning that the star is really double, the two components being too close to be seen with any telescope. But as they revolve around each other there is a time when the two stars are in line with the earth, and hence neither one is approaching or receding. Then the lines are single. Later there comes a period when, if we could see the stars, they would appear side by side, one star going from us, the other toward us. The former then causes the red shift, and the latter the blue, so that the single line splits into two. This process repeats periodically, and from it astronomers have found that a complete revolution of one star about the other is completed in 104 days.

Still higher than Auriga, close to the

zenith, is the group of Perseus, representing the famous champion who slew Medusa. The stars of Perseus are arranged in the shape of a V, with its point now directed to the north. The eastern part of the V is curved over towards the eastern horizon, while the western line is more nearly straight. Next to the southernmost star on the western side is the famous variable star Algor, which is usually of the 2.1 magnitude, fairly bright. But look at this star at any of the following times: December 10, 2:10 a. m.; December 12, 11:00 p. m.; December 15, 7:50 p. m.; or December 30, 3:50 a. m. (all Eastern Standard). Then you will find it much fainter, of magnitude 3.2.

If you watch it steadily you will observe that about five hours before the times mentioned it starts to diminish in brightness, and five hours afterwards it has returned to its normal brilliance. The reason for this is that Algor is also a double star, but instead of the two components being of approximately the same brightness, one is much darker than the other. Once every 69 hours, the fainter star partially eclipses the brighter one. Of course, the star is so distant that we can not see part of the disc of one star covered by the other, but the light is reduced; and the studies of astronomers have left no possible doubt that this is the true explanation of the variation of this star. Many other variable stars are known, but not all of them are of this "eclipsing double" type.

Directly west of Perseus is Andromeda, the chained lady. And next to her is Pegasus, the winged horse upon which Perseus rode to her rescue. The Great Square in Pegasus, a familiar guide to the stars, is now resting on one corner, high in the western sky.

The eighth and ninth of the first magnitude stars to be seen in the evening sky this month can be found low in the northwest. The northern cross, in Cygnus, the swan, stands upright, close to the horizon, with Deneb at the top. Lower and farther north is Vega, in Lyra, soon to vanish from the evening sky for a few months.

#### Planets Retire Early

Though no planets are up late enough to be visible at the time that the maps represent (10:00 p. m., December 1; 9:00 p. m., December 15, and 8:00 p. m., December 31), three of them can be seen earlier in the evening. Brightest of all is Venus, which



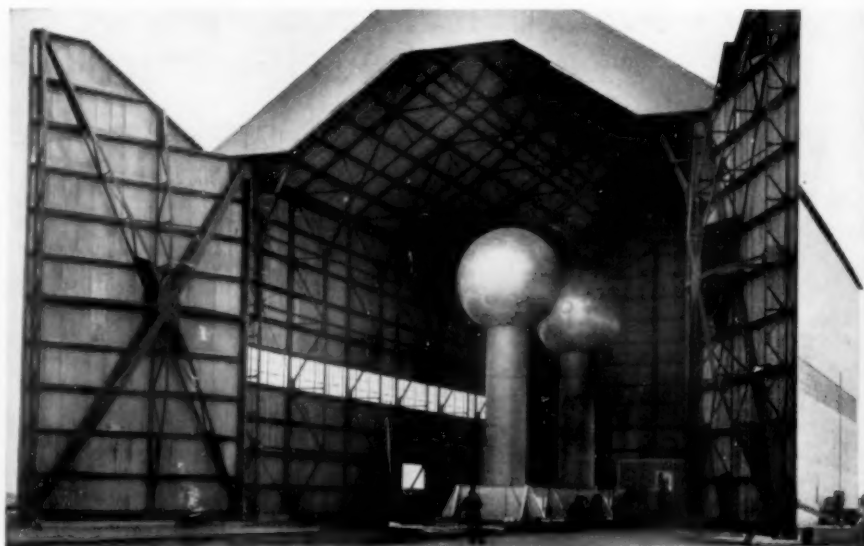
sets about three hours after the sun, and can be seen before that low in the southwest. On December 31 it will reach its greatest brightness. Then it will be of magnitude minus 4.4, far more brilliant than any other star or planet. Farther west, and considerably fainter, can be seen Mars. Saturn is farther to the east of Venus in the early part of the month. On December 21, at 5:00 a. m., the two planets pass, at which time Venus will be 20 seconds, about two thirds the moon's diameter, to the south. But, of course, at that hour they will not be visible from any part of the United States. On the previous evening, however, they will be close together, with Venus to the west, and on the next day they will be close, but with their relative positions reversed. It will be interesting to watch them night by night through the month as they draw close together, then spread apart.

In addition, the moon enters the picture. On the twentieth, at 2:04 a. m., it passes to the north of Venus, at a distance about a third greater than its own diameter. A little more than an hour later, at 3:15 a. m., it passes north of Saturn, at a distance of about two-thirds of its diameter. This also will be invisible to Americans, but the three bodies so close together, on the nights before and after, will form a beautiful spectacle in the west. Coming just before Christmas, it will remind us of the legend of the star which the Wise Men followed to Bethlehem; for one explanation of that object was a conjunction of three planets in the western sky which occurred at about that time.

### Sun Farthest South

During December, the moon goes through its phases as follows: on December 1 it is full, on the tenth at last quarter, on the sixteenth new, on the twenty-third at first quarter, and full again on the thirty-first. This will mean moonlit evenings from the first to about the third, and during the last ten days of the month. On December 22, at 1:58 a. m., Eastern Standard Time, the sun, in the course of its annual journey around the sky, reaches its farthest south position, the winter solstice, and this marks the beginning of winter. At this time, also, the sun rises latest and sets earliest, for us in the northern hemisphere. In the southern hemisphere conditions are reversed. There summer begins on this day, which is for them the longest of the year.

*Science News Letter, December 2, 1933*



**GREATEST GENERATOR**

*An airship hangar was needed to house the Van de Graaff generator.*

PHYSICS

## Scientists Unleash Largest Atom-Attacking Machine

**S**EVEN MILLION volts, man's closest approach to the voltage of nature's lightning, flashed across the gigantic ball terminals of science's greatest generator, erected by Massachusetts Institute of Technology physicists in Col. E. H. R. Green's airship hangar at Round Hill, Mass., and operated Tuesday for the first time at so great an electrical potential.

Sparks forty feet long were sent arcing between the two huge metal spheres of the generator. Though the seven million volts achieved is three times the highest direct current potential heretofore attained, it is less than the generator's full designed voltage by three million volts. A full voltage test was not attempted because high winds prevented taking the machine into the open, but the designer feels confident that ten million volts will be produced on the first outdoor test.

This is the opening report in an investigation of some of the most important and fundamental of nature's secrets and it may have far reaching consequences in even the commercial generation of electric power.

A few years ago there was a young Rhodes scholar at that old English university, Oxford. Puzzling upon the problem of power for smashing the

atom and studying its internal structure, Dr. Robert J. Van de Graaff went back to the idea of the old-fashioned static generator for electricity, the sort of electrical machine used by Ben Franklin, pioneer American scientist.

Modern electrical generation had developed along the line of electro-magnetism and Dr. Van de Graaff revived the other principle and built it into a modern machine. He went to Princeton University as a National Research Fellow, and built a small laboratory model of his generator at the cost of a few hundred dollars. It produced between 1,000,000 and 1,500,000 volts, the highest direct voltage current ever attained up to that time. Much more expensive apparatus, upon which other scientists had worked for years had been able to produce only 800,000 volts direct current.

Working with Dr. Karl T. Compton, then professor of physics at Princeton, Dr. Van de Graaff joined the M. I. T. staff when Dr. Compton became president of that school.

With the aid of associates, they visualized a giant generator, the electricity producing machine that in its tests has fulfilled their expectations.

No conventional building at the Massachusetts In- (Turn to Page 366)

# Which of Your Friends?

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(19129)

## From Page 364

stitute of Technology, was large enough to house the large Van de Graaff generator. Col. Green offered his airship dock on his estate at Round Hill, Mass., a structure 140 feet long, 75 feet wide and 75 feet high, with railroad track running into it and doors that weigh over 23 tons.

The 10,000,000 volt Van de Graaff generator consists of two large hollow columns, 25 feet high and six feet in diameter, which are surrounded by a heavy polished aluminum sphere 15 feet in diameter. Each column is mounted on a heavy four-wheeled truck running on a railway track 14 feet wide. The spheres, which act as reservoirs into which electricity is poured by relatively small static generators at the base of the columns, rise to 43 feet above the ground.

Even while the generator is running at full potential, scientists can stay and work within the 15 foot diameter aluminum spheres, surrounded by high potential electric fields.

The giant aluminum spherical terminals are unique in construction, the largest such structures of this metal ever produced. They were made by fabricating orange-peel sections which were welded and then polished to a bright finish so as to eliminate projections that would cause the electricity to spark

away. Although built of light metal a half inch thick, each hollow ball weighs a ton and a half.

The spheres are charged with electricity by a process not unlike the old-fashioned method of raising water from a well by means of small buckets on an endless chain, each bucket dumping its load as it turns over a pulley at the top. Paper belts, four feet wide, convey upward the electrical charges sprayed upon them at the base at the comparatively low pressure of 20,000 volts. Or the giant generator can actually be operated without any artificial source of electricity, as it can draw the necessary electrical charges from the earth. The picture on the cover was taken with the camera pointed up one column. It emphasizes the paper belt.

When the real work of the Van de Graaff generator begins, there will be no spectacular electrical fireworks. A large vacuum tube, a foot in diameter and 40 feet long, designed by Dr. L. C. Van Atta, made not of glass as is usual but of laminated paper, will extend from one sphere to the other and the electricity will discharge through it, creating the most powerful X-rays ever known by hurling millions of electrical "bullets" against a metal target. Each of these "bullets" will be moving at velocities 100,000 times greater than the speed of any rifle bullet.

*Science News Letter, December 2, 1933*

## PHYSIOLOGY

# "Sensitivity" to Cold May Cause Death by Drowning

**P**ERSONS who are sensitive to cold risk their lives bathing in cold water," states the editor of the American Medical Association.

Sensitive, however, is used here in a very special sense. Certain persons, it has been found, are "sensitive" to cold, or to heat, just as hay fever sufferers are sensitive to the pollens of some plants.

These cold-sensitive persons may have hives, swelling of the skin, pain in the joints, sneezing and irritation of the nose, asthma, headaches and many other disturbances when they are exposed to cold air, cold water or cold objects.

More serious is the fact that bathing in cold water or walking in a cold, moist wind may cause severe "shock." Apparently this cold-sensitiveness may lead to death while bathing in cold

water. It may be the cause of drownings that are otherwise unexplainable.

Several European physicians have reported cold-sensitiveness both in themselves and in patients which caused nearly disastrous bathing accidents.

One of these physicians has attacks of sneezing and running of the nose when he puts his foot out of the warm bed. His hands swell and become itchy when in cold water. Several times when swimming he has suddenly become so weak that he could scarcely reach the shore before collapsing. At the same time, giant hives appeared around his joints. He had a similar reaction once in a cold air bath. He is of the opinion that such hypersensitiveness to cold may be present only at times.

*Science News Letter, December 2, 1933*



ORNITHOLOGY



## Specialists in Feathers

**B**IRDS seem to be about the most plastic of all the backboneed animals, in their ability to develop adaptations to special requirements of their environments. Practically alone among vertebrates, they have completely conquered that most difficult of all the elements, the air; and yet they can be found competing successfully with mammals, reptiles and fish on the earth and in the water. Every environmental niche has a bird species that fits it exactly: the swallow to the air, the duck to the water, the ostrich to the desert, the stork to the swamp.

The race of birds began, apparently, by the hardest conquest of all, the conquest of the air. For this the extension of the forelimbs and the practical loss of the fingers. For this the development of long quill-feathers, at once marvelously light and marvelously strong as little sails. For this the lightening of all the bones, the deepening of the breastbone into a great keel for the attachment of the wing muscles, the heightened rate of basic physiologic processes releasing energy. For this the streamlining coat of body feathers, the remarkable steering tail.

Yet, having made this conquest, some birds abandoned it almost immediately, and became swimmers par excellence, swimmers good enough to beat fish at their own game and make them their prey by simply outswimming them. The flying wings lost their flying feathers and became paddles for the penguin. The light, grasping feet became heavier and stronger, webbed for goose and duck and gull, paddle-toed for grebe; the keel was reduced or lost where flight was no longer important; but among the birds that fly long journeys, the keel was usually kept.



Other birds that gave up flight to live on land instead of in the water stressed the evolution of legs: powerful implements in the ostrich, ending in stump toes that are almost hoofs; wide-toed feet among the swamp-dwellers like the crane, operating snowshoe-fashion on the soft, yielding muddy bottoms.

Even among the fliers, greater specialization: long wings and short tails among the great ones that brave the upper winds, like albatross and eagle; short wings and long, frequently ornamental tails among the flitters through treetops and bushes, like the macaws and the magpies.

And so the tale might be continued indefinitely: excellent fitting to the task before them, of beak, feather, claw, wing and tail. Truly, the birds must be voted biological successes!

*Science News Letter, December 2, 1933*

#### GENETICS

### "Like Attracts Like" May Explain Childless Couples

THE OLD saying that "like attracts like," which has been verified by statistical studies of marriage selection, may be the explanation of some childless marriages.

A study of 107 childless couples conducted by C. M. Pomerat, of Clark University, and reported by him to *Science* reveals that the men and their wives were unusually alike in height and trunk length. These couples all desired children but remained infertile.

Mr. Pomerat is continuing his research. These initial findings, if confirmed, are eugenically important because they suggest a possible relation between the similarity of man and wife and the possibility of bearing children, he pointed out.

*Science News Letter, December 2, 1933*

More than two million children of school age, up to 16 years, are not receiving education during this education crisis, a government statement shows.

Ten thousand bushels of pine cones and other seeds are being harvested by civilian conservation corps workers for tree planting in the Tennessee Valley.

The problem of dust as a health hazard in industry is shown by the case of a contractor who had more than 400 damage suits for silicosis, totalling \$4,000,000, filed against him by workers boring a three-mile tunnel.

## •First Glances at New Books

Additional Reviews on Page 368

#### Psychology-Heredity

HEREDITY AND ENVIRONMENT—Gladys C. Schwesinger—*Macmillan*, 484 p., \$4. A comprehensive review of studies bearing on the moot question of which contributes most to human intellectual ability, the inherited ability the infant brings into this world with him or the many varied experiences he encounters after his arrival. The author concludes that extremists on both sides of the question are wrong, and the question still awaits a conclusive answer.

*Science News Letter, December 2, 1933*

#### Mechanical Engineering

MODERN ELECTRIC AND GAS REFRIGERATION—A. D. Althouse and Carl H. Turnquist—*Goodheart-Willcox Co.*, 265 p., \$4. A practical handbook and text which should be of great service to those undertaking to prepare themselves to service mechanical household refrigerators. It will also interest any individual who wishes to know what makes it cold in his modern kitchen refrigerator.

*Science News Letter, December 2, 1933*

#### General Science-Education

SCIENCE STORIES, BOOK ONE—Wilbur L. Beachamp, Gertrude Crampton and William S. Gray—*Scott, Foresman*, 144 p., 60c. Simple stories on seasons, weather, animals, plants, sun, moon and stars written for easy reading and understanding by first-graders. The illustrations in full color are attractive.

*Science News Letter, December 2, 1933*

#### Mathematics—Education

GEOMETRY PROFESSIONALIZED FOR TEACHERS—Halbert Carl Christoffer-son—*George Banta*, 204 p., \$1.50. This book is designed to give a teacher or prospective teacher a mastery of the subject matter of geometry and simultaneously to train him in the method of teaching demonstrative geometry in the high schools.

*Science News Letter, December 2, 1933*

#### Biology

LA PALEONTOLOGIE & LES GRANDS PROBLEMES DE LA BIOLOGIE GENERALE, Part I, L'Evolution Adaptations et Mutations—Charles Fraipont and Suzanne Leclercq—*Hermann & Cie*, 38 p., 9 fr. Part II, Adaptations et Mutations—Charles Fraipont—*Hermann & Cie*, 24 p., 6 fr.

*Science News Letter, December 2, 1933*

#### Hygiene

PHYSIOLOGICAL HEALTH—ed. by Jay B. Nash—*Barnes* 308 p., \$2. Fourth volume in the New York University School of Education series on Interpretations of Physical Education. Physiological health is defined, its relationship to other educational objectives discussed, and methods of attaining it are described. The book is written by specialists in health education and physical education, mental hygiene and psychiatry, and medicine. It is somewhat surprising not to find, in a book on physiological health, any contributions from physiologists.

*Science News Letter, December 2, 1933*

#### Psychiatry-Psychology

DEMENTIA PRAECOX—Harriet Babcock—*Science Press*, 167 p., \$3. As the subtitle indicates, this is a psychological study, not a medical work. In the modern hospital for the insane, the psychologist and the physician are of mutual assistance in solving the great enigma of mental disease. In the study here reported, 216 sane persons of widely diverse mental age are compared with 206 persons suffering from dementia praecox. The results show that the patients with this type of mental disease have a mental defect even in the earliest stages, and the author concludes that "it is unwarranted to attribute this inefficiency to any but physiological causes, although the exact nature of these causes may not be known."

*Science News Letter, December 2, 1933*

#### Education

PROGRAMS OF GUIDANCE—William C. Reavis—*Govt. Print. Off.*, 144 p., 10c. Monograph No. 14 of the National Survey of Secondary Education describing what is being done by the schools in the way of vocational and educational guidance.

*Science News Letter, December 2, 1933*

#### Peace-Education

INTERNATIONAL UNDERSTANDING THROUGH YOUTH—International Institute of Intellectual Co-operation—*World Peace Foundation*, 200 p., cloth \$1.85; paper \$1.50. A report of an inquiry into present practices with regard to the exchange of school pupils between nations and the visiting of families in foreign countries for the purpose of giving their children understanding of other peoples.

*Science News Letter, December 2, 1933*

# •First Glances at New Books

Additional Reviews  
on Page 367

## Education

**SOCIAL EDUCATION**—Edward C. Lindeman—*New Republic*, 231 p., \$1. The education offered by our schools should be better adapted to equip the individual to master social problems. In his preface the author says, "The great scientific revolution is still to come. It will ensue when men collectively and cooperatively organize their knowledge for application to achieve and make secure social values; when they systematically use scientific procedures for the control of human relationships and the direction of the social effects of our vast technological machinery. Great as have been the social changes of the last century, they are not to be compared with those which will emerge when our faith in scientific method is made manifest in social works."

*Science News Letter*, December 2, 1933

## Reference Books

**INTERNATIONAL BOOK OF NAMES**—C. O. Sylvester Mawson—*Crowell*, 308 p., \$2. A dictionary of the more difficult proper names in literature, history, philosophy, religion, art, music, and geography.

*Science News Letter*, December 2, 1933

## Astronomy

**A STAR ATLAS AND REFERENCE HANDBOOK (EPOCH 1920)**—Arthur P. Norton—*Eastern Science Supply Co.*, 51p. 18 maps, \$4.50. A new and fifth edition of a British atlas primarily designed for those amateur telescopists whose instruments are mounted either on alt-azimuth stands or as equatorials without graduated circles.

*Science News Letter*, December 2, 1933

## Nutrition-Dental Hygiene

**DIET AND DENTAL HEALTH**—Milton T. Hanke—*University of Chicago Press*, 236 p., limited advance ed., \$1; reg. ed., ready Feb. 1, 1934, \$4. Working with a group of Chicago dentists on the relation of nutrition to dental health, Dr. Hanke developed a dietary regime which was considered definitely beneficial to the private patients of the co-operating dentists. Scientifically controlled study of the regime was then made on a large scale at a children's home and the results on private patients were apparently confirmed. Both parts of the study are reported in this volume, which is liberally illustrated. Dentists, physicians and nutrition experts will be interested. The studies were carried on

partly at the Otho S. A. Sprague Institute at the University of Chicago and partly at Mooscheart, City of Childhood of the Loyal Order of Moose.

*Science News Letter*, December 2, 1933

## Chemistry

**THE ARTIFICIAL TRANSMUTATION OF THE ELEMENTS**—Lord Rutherford—*Oxford Univ. Press.*, 12 p., 40c. The thirty-fifth Robert Boyle Lecture delivered before the Oxford University Junior Scientific Club last June.

*Science News Letter*, December 2, 1933

## Nature Study

**THE CALIFORNIA DESERTS**—Edmund C. Jaeger—*Stanford Univ. Press*, 207 p., \$2. The Mohave and Colorado deserts constitute two of America's most fascinating regions for those who like the out-of-doors; they offer such sharp contrasts in climate and topography with the milder regions wherein most of us dwell, and the myriad devices whereby their many animal and plant inhabitants meet the hard conditions of their lives make them still more intriguing. Prof. Jaeger tells all of this most interestingly, and the numerous line illustrations help the newcomer to recognize the inhabitants.

*Science News Letter*, December 2, 1933

## Engineering

**REPORT OF THE COMMISSION TO STUDY THE PROPOSED HIGHWAY TO ALASKA, 1933**—*Govt. Print. Off.*, 116 p., 25c.

*Science News Letter*, December 2, 1933

## Psychic research

**A CERTAIN TYPE OF PSYCHIC RESEARCH, AND OTHER REVIEWS**—Herbert Thurston and others—*Boston Society for Psychic Research*, 59 p., 60c.

*Science News Letter*, December 2, 1933

## Journalism

**AROUND THE COPYDESK**—George C. Bastian, Leland D. Case, R. E. Wolseley—*Macmillan*, 200 p., \$2.25. An exercise book in the preparation of news copy for the printer.

*Science News Letter*, December 2, 1933

## Mycology

**MUSHROOMS**—W. B. McDougall—*Houghton Mifflin*, 151 p., \$3.50. Mushrooms are always fascinating, both as objects of study and as subjects for practical gastronomy. One of the troubles with the latter aspect of their interest, however, is that almost everybody is afraid of them, for it is well enough known now that none of the old rule-of-thumb tests for poisoniveness is at all reliable, and that to be safe you must simply know your mushrooms. Prof. McDougall makes identification easy by clearly-written plain-English text and first-class photographic illustrations, and he adds judicious comment on the relative virtues of the edible species.

*Science News Letter*, December 2, 1933

## Electricity

**MCDONALD'S ELECTRICAL DICTIONARY**—George McDonald—*Meador*, 178 p., \$1.50. Both practicing engineers and students should find this book valuable.

*Science News Letter*, December 2, 1933

## Physics

**INSIDE THE ATOM**—John Langdon Davies—*Harper*, 184 p., \$2. This very popularized presentation of physics in everyday life should be of interest to science-minded boys and girls in particular. It is profusely illustrated with line sketches.

*Science News Letter*, December 2, 1933

## Mathematics

**DESCRIPTIVE GEOMETRY**—F. H. Cherry—*Macmillan*, \$2. This text, by the associate professor of mechanical engineering at the University of California, attempts to improve the unsatisfactory reputation that descriptive geometry has among students.

*Science News Letter*, December 2, 1933

## Museology

**WHO'S WHO IN THE MEMBERSHIP OF THE AMERICAN ASSOCIATION OF MUSEUMS**—Comp. by Mary A. Bingham—*Amer. Assn. of Museums*, 47 p., \$1.

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